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AN OVERVIEW STUDY OF DUAL-BAND MICROSTRIP ANTENNA FOR NON-INVASIVE HYPERTHERMIA TREATMENT

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ABSTRACT

An overview study of dual-band microstrip antenna for non-invasive hyperthermia treatment is presented. This dual-band microstrip antenna is predicted to enhance the hyperthermia treatment for cancer, especially when different sizes of cancers are concerned. Appropriate design and modification of dual-band structures, which to be integrated into a microstrip antenna, are significant to ensure the performance of hyperthermia treatment is obtained with less adverse health effects simultaneously. Based on the previous study, there are various structures to attain dual-band frequency. However, the slot structure is the most suitable to be used and further investigated as this structure has shown acceptable beamwidth distribution patterns and good directivity, which are important parameters for hyperthermia treatment, especially in determining the focus position distance on the treated tissue. Further study on various slot structures for dual-band is then carried out to identify the most suitable slot structures that will be modeled and modified further in SEMCAD X to observe the heating distribution on the treated tissue. A U-slot structure is the most appropriate structure to be integrated with a microstrip antenna. The integration is to produce the modified dual-band microstrip applicator that is predicted to offer improvement to hyperthermia treatment, especially in terms of EM energy focus position distance to cater to different sizes of cancers.

Key words: Dual-band, Hyperthermia, Non-Invasive, Slot Structure, Modified